

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Gerbrand Deetman	:	Examiner: Necholus Ogden, Jr.
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Reissue Application Serial No.: 09/801,883	:	Group Art Unit: 1796
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Filed: March 8, 2001	:	Attorney Docket No.: 713629.354
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Customer No.: 27128	:	Confirmation No.: 7184
	:	
For: STABILIZED PHOSPHATE	:	
ESTER BASED FUNCTIONAL FLUID	:	
COMPOSITIONS	:	

APPEAL BRIEF
TO BOARD OF PATENT APPEALS AND INTERFERENCES
UNDER 37 C.F.R. § 41.37

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant submits the following Appeal Brief to the Board of Patent Appeals and Interferences under 35 C.F.R. § 41.37. The Notice of Appeal was filed on April 24, 2008.

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I. The Real Party in Interest

The real party in interest for the above-referenced application is Solutia Inc., having a principal place of business at 575 Maryville Center Drive, St Louis, Missouri 63141, the Assignee of record of the entire right, title and interest in the invention, the patent and the above-identified reissue patent application.

II. Related Appeals and Interferences

There are no other appeals or interferences known to Applicant, Appellant's Legal Representative or Assignee which will directly affect or be directly affected by, or have a bearing on, the Board of Patent Appeals and Interferences' decision in the pending appeal.

III. Status of Claims

Claims 1-130 have been cancelled. Added claims 131-152 are currently pending in the present application and are the subject of this appeal. Claims 131-152 stand finally rejected under 35 U.S.C. 251 as being an improper recapture of broadened claimed subject matter surrendered in the application for the patent upon which the present reissue is based. Also, claims 131-152 stand rejected under 35 U.S.C. 103(a).

IV. Status of Amendments

In the current application, an Amendment responsive to the Final Rejection, mailed November 27, 2007, was filed January 28, 2008. An Advisory Action, mailed on February 14,

2008, stated that the Amendment was not entered by the Examiner on the basis that it would create new issues that would require further consideration and/or search.

After a telephonic interview by Appellant's attorney with the Examiner on March 28, 2008, a Supplemental Amendment in response to the Final Rejection was filed on March 31, 2008 to replace and supersede the earlier Amendment responsive to the Final Rejection. The Supplemental Amendment corrected an inadvertent error in the designation of claims 137, 138 and 140 as new claims. Also, claim 152 that had been rejected as being dependent on a previously cancelled claim was amended to correct the inadvertent error by referring to a pending claim.

An Advisory Action, mailed April 11, 2008, stated that the amendments in the Supplemental Amendment were entered, but that the arguments were not persuasive to remove the Final Rejection now on appeal.

V. Summary of the Claimed Subject Matter

Claims 131 - 152 are pending in the present application. Claims 131 and 134 are independent claims and there are also twenty (20) dependent claims. Claims 1 - 130 are not part of this appeal, having been previously cancelled. Support for the independent claims on appeal is set forth in the chart below by reference to the specification by column and line number.

The principal focus of the present invention is on a novel additive package useful in phosphate ester based hydraulic fluids employed in the hydraulic systems of modern, high performance jet aircraft requiring more stringent tolerances than previously required. An additive package is necessary to stabilize the fluids in the extreme conditions of temperature,

pressure and other factors of use. The additive package extends the useful life of the fluid and inhibits damage to the mechanical parts of the hydraulic system in contact with the fluid. The currently claimed combination of components in the additive package surprisingly improve not only the latest high performance phosphate ester fluid, but also has been found to improve the phosphate ester fluids of the prior art.

Appellant contends that the claims on appeal have never been previously filed during prosecution leading to issuance of the parent patent, but could have been filed in the application Serial No. 07/897,189 filed June 11, 1992. However, through inadvertence and mistake, the claims now on appeal were never filed in application Serial No. 07/897,189 or in any other application related to application Serial No. 07/897,189.

Claim 131 is an independent claim directed to a novel combination of additives useful for mixing with a phosphate ester based aircraft hydraulic fluid and reads:

“131. A novel combination of additives useful for mixing with phosphate ester based aircraft hydraulic fluids comprising:

- (a) an acid scavenger comprising an epoxide compound;
- (b) an anti-erosion additive comprising an alkali metal salt of a perfluoroalkyl sulfonic acid;
- (c) a viscosity index improver comprising a methacrylate ester polymer at least 95% by weight of the polymer having a molecular weight of between about 50,000 and 1,500,000; and
- (d) an antioxidant wherein said antioxidant is selected from the group consisting of a hindered phenol and said hindered phenol in combination with an amine compound.”

Support in the disclosure for each element of claim 131 is shown in the chart below.

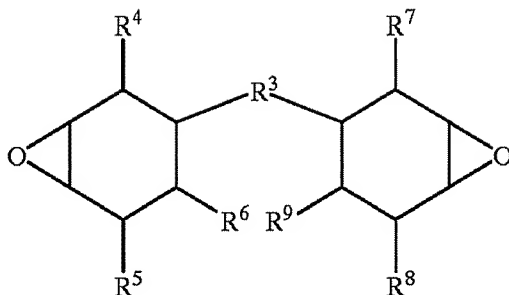
Claim 131. <u>A novel combination of additives suitable for use in phosphate ester based aircraft hydraulic fluids comprising:</u>	In addition to the improved base stock, the composition of the invention preferably contains a combination of additives which further enhances the properties of the fluid as compared with fluids previously available in the art for use in aircraft hydraulic systems. -- Col. 7, lines 56-60. ... the additive combination of the invention also affords beneficial results when used in combination with any of a variety of base stock compositions known to the art. -- Col. 12, lines 4-7.
(a) <u>an acid scavenger comprising an epoxide compound;</u>	Preferably, the acid scavenger is a 3,4-epoxycyclohexane carboxylate composition of the type described in U.S. Pat. No. 3,723,320. Also useful are diepoxides such as those disclosed in U.S. Pat. No. 4,206,067 which contain two linked cyclohexane groups to each of which is fused an epoxide group. -- Col. 7, line 66 - Col. 8, line 5.
(b) <u>an anti-erosion additive comprising an alkali metal salt of a perfluoroalkyl sulfonic acid;</u>	The anti-erosion additive is preferably an alkali metal salt, more preferably a potassium salt of a perfluoroalkylsulfonic acid. -- Col. 9, lines 1-3.
(c) <u>a viscosity index improver comprising a methacrylate ester polymer at least 95% by weight of the polymer having a molecular weight of between about 50,000 and 1,500,000; and</u>	Preferably, the viscosity index improver comprises a poly(alkyl methacrylate) ester ... -- Col. 8, lines 31-33. Preferably, the viscosity index improver of the invention has a relatively narrow range of molecular weight, approximately 95% by weight of the viscosity index improver component having a molecular weight of between about 50,000 and about 1,500,000. -- Col. 8, lines 36-41.
(d) <u>an antioxidant wherein said</u>	The composition of the invention also contains a

<u>antioxidant is selected from the group consisting of a hindered phenol and said hindered phenol in combination with an amine compound.</u>	combination of antioxidant additives, preferably including both a hindered phenol and a hindered polyphenol. -- Col. 9, lines 29-31. The composition may also include an amine antioxidant, preferably a diarylamine such as, for example ... -- Col. 9, lines 49-51.
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Claim 134 is an independent claim directed to a novel combination of additives suitable for use in phosphate ester based aircraft hydraulic fluids and reads:

“134. A novel combination of additives suitable for use in phosphate ester based aircraft hydraulic fluids comprising:

- (a) a viscosity index improver a viscosity index improver comprising a methacrylate ester polymer, the repeating units of which substantially comprise butyl and hexyl methacrylate, at least 95% by weight of the polymer having a molecular weight of between about 50,000 and about 1,500,000;
- (b) an anti-erosion comprising an alkali metal salt of a perfluoroalkylsulfonic acid, the alkyl substituent of which is selected from the group consisting of hexyl, heptyl, octyl, nonyl, decyl, and mixtures thereof;
- (c) an acid scavenger and selected from the group consisting of a derivative of a 3,4-epoxy cyclohexane carboxylate and a diepoxide compound corresponding to the formula:



wherein R^3 is an organic group containing 1 to 10 carbon atoms, from 0 to 6 oxygen atoms and from 0 to 6 nitrogen atoms, and R^4 through R^9 are independently selected from among hydrogen and aliphatic groups containing 1 to 5 carbon atoms, and mixtures of the 3,4-epoxycyclohexane carboxylate and the diepoxide compound;

- (d) 2,4,6-trialkylphenol,
- (e) a di(alkylphenyl)amine; and
- (f) a hindered polyphenol selected from the group consisting of bis(3,5-dialkyl-4-hydroxyaryl)methane, 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxyaryl)benzene, and mixtures thereof.”

Support in the disclosure for each element of claim 134 is shown in the chart below.

<p>134. <u>A novel combination of additives suitable for use in phosphate ester based aircraft hydraulic fluids comprising:</u></p>	<p>In addition to the improved base stock, the composition of the invention preferably contains a combination of additives which further enhances the properties of the fluid as compared with fluids previously available in the art for use in aircraft hydraulic systems. -- Col. 7, lines 56-60.</p>
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	... the additive combination of the invention also affords beneficial results when used in combination with any of a variety of base stock compositions known to the art. -- Col. 12, lines 4-7.
(a) <u>a viscosity index improver comprising a methacrylate ester polymer, the repeating units of which substantially comprise butyl and hexyl methacrylate, at least 95% by weight of the polymer having a molecular weight of between about 50,000 and about 1,500,000;</u>	<p>Preferably, the viscosity index improver comprises a poly(alkyl methacrylate) ester ... -- Col. 8, lines 31-33.</p> <p>Preferably, the viscosity index improver of the invention has a relatively narrow range of molecular weight, approximately 95% by weight of the viscosity index improver component having a molecular weight of between about 50,000 and about 1,500,000. This result is achieved in part by utilization of predominantly butyl and hexyl methacrylate esters. -- Col. 8, lines 36-42.</p>
(b) <u>an anti-erosion comprising an alkali metal salt of a perfluoroalkylsulfonic acid, the alkyl substituent of which is selected from the group consisting of hexyl, heptyl, octyl, nonyl, decyl, and mixtures thereof;</u>	<p>The anti-erosion additive is preferably an alkali metal salt, more preferably a potassium salt of a perfluoroalkylsulfonic acid. -- Col. 9, lines 1-3.</p> <p>Typically, the alkyl component comprises hexyl, heptyl, octyl, nonyl, decyl, or mixtures thereof, with perfluorooctyl generally affording the best properties. -- Col. 9, lines 5-7.</p>
(c) <u>an acid scavenger and selected from the group consisting of a derivative of a 3,4-epoxy cyclohexane carboxylate and a diepoxide compound corresponding to the formula:</u>	<p>Preferably, the acid scavenger is a 3,4-epoxycyclohexane carboxylate composition of the type described in U.S. Pat. No. 3,723,320. Also useful are diepoxides such as those disclosed in U.S. Pat. No. 4,206,067 which contain two linked cyclohexane groups to each of which is fused an epoxide group. Such diepoxide compounds correspond to the formula:</p> <p style="text-align: center;">[Formula structure omitted]</p> <p>... wherein R³ is an organic group containing 1 to 10 carbon atoms, from 0 to 6</p>

<div data-bbox="331 319 701 611" data-label="Chemical-Block"> </div> <p>wherein R^3 is an organic group containing 1 to 10 carbon atoms, from 0 to 6 oxygen atoms and from 0 to 6 nitrogen atoms, and R^4 through R^9 are independently selected from among hydrogen and aliphatic groups containing 1 to 5 carbon atoms, and mixtures of the 3,4-epoxycyclohexane carboxylate and the diepoxide compound;</p>	<p>oxygen atoms and from 0 to 6 nitrogen atoms, and R^4 through R^9 are independently selected from among hydrogen and aliphatic groups containing 1 to 5 carbon atoms. -- Col. 7, line 61 - Col. 8, line 19.</p>
<p>(d) <u>2,4,6-trialkylphenol,</u></p>	<p>It is generally preferred that the composition contain between about 0.1% and about 0.7% of a 2,4,6-trialkylphenol, preferably... -- Col. 9, lines 36-38.</p>
<p>(e) <u>a di(alkylphenyl)amine; and</u></p>	<p>The composition may also include an amine antioxidant, preferably a diarylamine such as, for example, phenyl-α-naphthylamine or alkylphenyl-α-naphthylamine, or the reaction product of N-phenylbenzylamine with 2,4,4-trimethylpentene sold under the trade designation Irganox® L-57 by Ciba-Geigy; diphenylamine, ditolylamine, phenyl tolylamine, 4,4'-diaminodiphenylamine, di-p-methoxydiphenylamine, ... -- Col. 9, lines 49-57.</p>
<p>(f) <u>a hindered polyphenol selected from the group consisting of bis(3,5-dialkyl-4-hydroxyaryl)methane, 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxyaryl)benzene, and mixtures thereof.</u></p>	<p>The composition should further include between about 0.3% and about 1% of a hindered polyphenol compound, such as a bis(3,5-dialkyl-4-hydroxyaryl) methane, for example, the bis(3,5-di-tert-butyl-4-hydroxyphenyl)methane sold under the trade</p>

	designation Ethanox® 702 by the Ethyl Corp., a 1,3,5-trialkyl-2,4,6-tris(3,5 -dialkyl-4-hydroxyaryl) aromatic compound, for example, the 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl- 4-hydroxyphenyl)benzene sold under the trade designation Ethanox® 330 by the Ethyl Corp., or mixtures thereof. -- Col. 9, lines 40-49.
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VI. Grounds of Rejection to be Reviewed on Appeal

A. Claim Rejection Under 35 U.S.C. § 251

Claims 131-152 are rejected under 35 U.S.C. § 251 as being an improper recapture of broadened claimed subject matter surrendered by amendment in the application for the patent upon which the present reissue is based.

B. Claim Rejection Under 35 U.S.C. 103(a)

Claims 131-152 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacKinnon et al (U.S. Patent 4,206,067) in view of Smith (U.S. Patent 3,679,587).

C. Claim Rejection Under 35 U.S.C. 103(a)

Claims 131-152 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mackinnon (U.S. Patent 4,206,067) in view of Smith (U.S. Patent 3,679,587) and further in view of Great Britain patent 1,370,728 and French patent 2,120,127.

VII. Argument

Introduction

A. Brief Description of the Prosecution History

1. A new application was filed June 11, 1992, and given Serial No. 07/ 897,189 which was abandoned on July 28, 1993 in favor of a continuation-in-part application.
2. The continuation-in-part application of new application Serial No. 07/897,189 was filed July 28, 1993 and given Serial No. 08/099,267 which issued as Patent No. 5,464,551 on November 11, 1995.
3. A request for reexamination of Patent No. 5,464,551 was granted on September 3, 1997 based upon a substantial new question of patentability affecting claim 1-89 and given Control No. 90/004,683.
4. While the reexamination application was pending, an application for reissue of Patent No. 5,464,551 was filed on November 7, 1997 and given Serial No. 08/966.425.
5. On April 23, 1998 the U.S. Patent & Trademark Office issued a decision to merge the reexamination and reissue proceedings.
6. Reissue application Serial No. 08/966,425 issued as Reissue Patent 37,101 on March 20, 2001 containing original claims 1-89 as amended and new claims 90-118.
7. A continuation reissue application of was filed March 8, 2001 and given application Serial No. 09/801,883.

B. Claim rejection under 35 U.S.C. 251

With regard to the rejection under 35 U.S.C. 251 it must be noted that throughout the entire long history of this application the only claims pending, including those allowed in US 5,464,551 and RE 37,101, have been directed to “a fluid composition suitable for use as an aircraft hydraulic fluid”. In such claims the first ingredient was a defined combination of phosphate esters. The presently rejected claims are directed to “a novel combination of additives suitable for use in phosphate ester based aircraft hydraulic fluids”. In other words, the present claims are genus claims to what is termed in this art as an “additive package”, whereas the prior claims in the record of this application were specie claims directed to a particular phosphate ester fluid composition containing additives.

The Examiner has taken the position that because the rejected claims do not contain a limitation to a specific phosphate ester fluid the claims have been impermissibly broadened under the “Recapture Rule”. While it is true that the claims of the parent patent were amended to claim a different phosphate ester fluid than was originally claimed, there were no claims presented directed to the additive package *per se* as is now claimed. Accordingly, there has been no prior prosecution of the present claims, i.e., no rejections or amendments thereto. In such a situation there cannot be any “broadening” of claims previously narrowed by amendment to overcome a rejection. It therefore follows that the “Recapture Rule” is inapplicable in this case.

More importantly, there was an error in the earlier prosecution of this application in that appellant’s attorney(s), by inadvertence and mistake, failed to claim what the appellant had a right to claim i.e., a novel additive package. As will be pointed out more particularly below, the inventor knew and had possession of the presently claimed invention upon filing the earliest

application in the file history of this application. He had a right to claim the present claims but such claims were never filed. It is respectfully submitted that the reissue section of the patent code was enacted precisely to correct the kind of error that occurred in the prosecution of the application resulting in the patent.

C. Rejection of claims 131-152 under 35 U.S.C. 103(a) as being unpatentable over MacKinnon et al (U.S. Patent 4,206,067) (hereinafter “the ‘067 patent”) in view of Smith (U.S. Patent 3,679,587) (hereinafter “the ‘587 patent”).

While the ‘067 patent discloses some phosphate ester functional fluids, the additive package for the phosphate ester base fluid differs from that claimed in Applicant’s reissue application, particularly in the area of agents to inhibit erosion and, if employed as directed in the specification, the amounts of ingredients of the additive package vary greatly from the prior art.. The ‘067 patent discloses a cure for a problem when phosphate esters functional fluids contain a perhalometallate or perhalometalloidate salt as an anti-erosion agent in the additive package. The presently claimed additive package does not contain such anti-erosion agents and therefore does not require the cure. To supply the deficiency of the ‘067 patent, the Examiner has combined it with the ‘587 patent that discloses phosphate ester functional fluid compositions containing an additive package that comprises an epoxide acid scavenger, an erosion inhibitor comprising a perfluoroalkyl sulfonic acid salts and a methacrylate viscosity index improver. While the ‘587 patent issued years before the filing of the ‘067 patent, there appears no interest to one of more that ordinary skill in this art (*i.e.* the inventor) to include the erosion inhibitor of Smith in the additive package now claimed. It would seem to have resolved the “problem”

sought to be cured by incorporating yet another material to the additive package of the '067 patent.

D. Rejection of claims 131-152 under 35 U.S.C. 103(a) as being unpatentable over the '067 patent in view of the '587 patent and further in view of Great Britain (1,370,728) (hereinafter "the British patent") and French (2,120,127) (hereinafter "the French patent").

To further supply the deficiencies of the '067 patent and the '587 patent, the Examiner combined them with the British patent and French patent that disclose the use of a hindered phenol to improve the oxidative stability of the phosphate ester functional fluid base stock. The British patent and French patent are viewed as cumulative to the '067 patent and further illustrate the long history of phosphate ester base stocks used as a functional fluids and the attempts to provide a superior additive package. However, such prior art additive packages never contained the remarkable combination of additives now claimed. It remained for Applicant to inform the world that improvements in the very best and latest phosphate ester base stocks, as well as those that preceded it, are surprisingly provided as shown by the results set forth in the present application and substantiated in the declaration of a scientist long involved in the development of improved phosphate ester base stocks.

Detailed Argument

A. Rejection Of Claims 131-152 Under 35 U.S.C. § 251

1. Proper claim construction of the claims on appeal provides no basis for a rejection under 35 U.S.C. 251 for impermissible broadening of claims under the Recapture Rule.

This reissue application was filed to correct an inadvertent error committed during the prosecution of the parent patent. Such error was failing to claim all that the appellant had a right to claim. In every claim filed in the record of the application which issued as US 5,464,551 and RE 37,101, the first portion was directed to a fire resistant phosphate ester base stock. This limitation was included in this reissue application until an Amendment, filed August 11, 2006, added new claims 107-130. The claims were further refined by the addition of new claims 131-152 now on appeal, wherein there is no limitation to a particular fire resistant phosphate ester base stock.

At page 6 of the Office Action containing the Final Rejection, the Examiner states “the functional fluid of the amended reissue application does not require a specific phosphate ester based fluid which is claimed more broadly since it does not include the limitation to just the preferred phosphate esters “...in which the alkyl substituents are substantially isoalkyl C4 or C5”. The error of the Examiner is shown by his statement that “the functional fluid of the amended reissue application” contains no limitation in the present claims directed to a “phosphate ester”. As is pointed out below, the correct claim construction of the appealed claims requires a conclusion that a mere reference to a use in a phosphate ester fluid in the preamble is not a limitation with respect to the claimed composition.

It is the Appellant's position that the preamble does not provide any limitation on the claimed compositions. Furthermore, there is no need to refer to the preamble for the purpose of understanding the present claims. Proper claim construction of the presently appealed claims requires the conclusion that the preamble does not constitute a limitation of the claimed composition.

The claims on appeal do not require a reference to the preamble for any definition or understanding of the claimed compositions. As will be shown below, given proper claim construction, the preamble does not provide any limitation with respect to a phosphate ester fluid in the claimed compositions. The only decisions that found the preamble to provide a limitation to the claimed subject matter were in those cases wherein the preamble gave meaning to latter elements of the claim. In Eaton Corp. v. Rockwell International Corp., 66 USPQ.2d 1271 (Fed. Cir. 1985) the preamble of a method claim for operating a truck transmission in two steps was limiting, because the steps described in the body of the claim could not be interpreted without reference to the structure provided in the preamble of the claims.

In composition claims, the preamble must "breathe life" and meaning into the claims in order for a proper claim construction can lead to a conclusion that the preamble contains a necessary limitation to the claims. See Loctite Corp. v. Ultraseal Ltd. 228 USPQ 90 (Fed. Cir. 1985). In that case, the term "anaerobic curing" was in the preamble of a claim to a composition that would polymerize to a solid state in the absence of air. The use of the term "anaerobic" in the preamble was considered a limitation. In other words, if the preamble contains language that helps distinguish the claimed invention from the prior art, then the preamble is essential to the description of the invention and constitutes a limitation in the claims.

A summary of the law with respect to the issue of whether the preamble of the claim constitutes a limitation is found in Pitney Bowes, Inc. v. Hewlett Packard Co. 51 USPQ 2d 1161 (Fed. Cir. 1999). Summarizing the principle applied in that case, the Federal Circuit stated that when a preamble sets forth only the purpose or intended use of the invention, without adding to the description of the invention in the body or providing any definition of a limitation in the body, then the preamble plays no role in the claim's construction.

In the present case, the only mention of "phosphate ester based aircraft hydraulic fluids" is in the preamble of the claims and is in an expression of intended use. As now claimed, there is no need to refer to the preamble to understand the scope and content of the components of the claimed composition. In the appealed claims, the preamble is merely descriptive of the intended use and is not needed to understand or "breathe life" into the body of the claims as was observed in the Pitney Bowes case cited above. Accordingly, the claim construction applied to the appealed claims by the Examiner in order to base the rejection on the Recapture Rule is not proper according to the legal precedents governing claim construction.

1.1 The inventor was in possession of the invention of the appealed claims at the time of the earliest filed application and filed the reissue application within two years after issue of the parent patent.

As can be seen from the review of the filing history of this reissue application, the earliest effective filing date of this reissue application is within the two-year limitation relating to broadened claims.

The original application stated that the additive package was novel. Thus, although the inventors took note of the fact that the additive package was novel, no claims to the additive package *per se* were ever made. Simply stated, the claims now presented are to a different invention than was claimed in the parent patent. Furthermore, the Recapture Rule does not apply because in the entire, lengthy history of the present application the appealed claims were not surrendered by amendment or as a result of any argument presented in any prior prosecution. Thus, it is respectfully submitted that there is no proper basis for the rejection under the Recapture Rule. The precedents cited by the Examiner, i.e., Pannu v. Storz Instruments, Inc., Hester Industries, Inc. v. Stein, Inc., In re Clement and Ball Corp. v. United States, are not controlling in this application.

2. Controlling precedents of In Re Michael P. Doyle and Medtronic Inc. v. Guidant Corp require reversal of the Rejection Under 35 U.S.C. 251 on the basis of the “Recapture Rule”.

The controlling precedents of In Re Michael P. Doyle 293 F3d 1355; 63 USPQ 2d 1161 (Fed. Cir. 2002), hereinafter referred to as “Doyle”, and Medtronic Inc. v. Guidant Corp. 465 F3d. 1360, 80 USPQ 2d 1558 (Fed. Cir. 2006), hereinafter referred to as “Medtronic”, require reversal of the rejection under 35 U.S.C. 251 based on the “Recapture Rule”. The invention in Doyle was a method of using chiral catalysts to catalyze enantioselectively particular classes of chemical reactions. Most reactions that produce these types of compounds do not produce only one type but rather a mixture of stereoisomers of a particular compound, called a racemic mixture. A category of reactions known as enantioselective reactions, however, will produce either one

enantiomer or a mixture that is enriched in a desired enantiomer. The application was subject to a nine-way restriction requirement and one of the nine categories was selected. Claims to the elected invention were allowed. Approximately one month after the two-year limit on broadening reissues, Doyle filed a request for reissue of the patent and gave as his reason for reissue that the patent was partially defective because the claims were more narrow than the disclosure. The newly requested claims were broader in order to cover the use of the defined catalysts to enantioselectively catalyze reactions with a prochiral compound. In other words, Doyle sought to cover the reaction of his catalysts with a genus of prochiral molecules, not just insertion of a carbene fragment. As in the present application, all of the claims in Doyle's reissue application were new claims, not amendments to issued claims. These claims were rejected on the grounds that the reissue declaration failed to specify an error correctable by reissue under the recapture and double patenting. After agreeing to file a terminal disclaimer if claims were allowed, he appealed the first two rejections. The court then stated that "The statute was remedial in nature, based on fundamental principles of equity and fairness, and should be construed liberally." This was followed by a statement that Section 251 was not a panacea to cure every mistake which might be committed by an Applicant or his attorney (the "Orita Doctrine").

In Doyle, the court did not agree that the Orita Doctrine applied to the reissue application because the new claims were neither identical nor substantially similar to the nonelected claims. The new claims were genus claims, neither identical nor substantially similar to the nonelected claims. The Court reasoned that Orita did not apply because the Applicant never asserted the reissue claims or anything similar to them in the original application and also never agreed to

prosecute the reissue claims in a divisional application. Further, the claims in the reissue application could have and should have been presented in the original application because they were linking claims.

It is important to understand that in Doyle, the Court recognized that the new claims were broader than the issued claims and therefore the “issued claims are wholly or partly inoperative or invalid ... by reason of the patentee claiming ... less than he had a right to claim in the patent.”

As noted earlier in the record of this reissue application, Appellant’s attorney has termed the new claims in this reissue application as “genus claims” that are not limited by the particular type of phosphate ester fluid. Similar to the Doyle case above, the Appellant did not present these genus claims during the prosecution of the parent patent by mistake. Similar to Doyle, the genus claims are broader than the claims of the issued patent but that is because they are directed to a different invention. Similar to Doyle, the mistake of the Appellant or his attorney rendered the patent “wholly or partly inoperative or invalid ... by reason of the patentee claiming ... less than he had a right to claim in the patent.” The only difference between the present facts and those of Doyle is the absence of a restriction requirement. Such difference is inconsequential to the appropriate law in this application because the court in Doyle dismissed the rejection based upon the Orita Doctrine. Simply stated, as in Doyle, Appellant did not claim all that he had a right to claim in the original patent and now relies on the reissue statute to remedy the error made without deceptive intent. As previously noted, this fact situation is “precisely the reason” the reissue statute was enacted.

In Medtronic according to the facts reported, there were two embodiments of a heart pacemaker disclosed and claimed in the original application. In one embodiment, the invention was to a method and apparatus for treating ventricular asynchrony by having heart ventricles contract simultaneously in a “conditional embodiment” wherein there were placed sensing electrodes in each ventricle. In the other embodiment termed “unconditional embodiment”, there was placed only one sensing electrode in one ventricle. While there were claims that incorporated both embodiments in the original application, the Examiner narrowed such claims to include only the “conditional embodiment” during a telephonic interview with Applicant’s attorney. The changes made by the Examiner were termed “minor wording changes” to put them in condition for allowance. The reissue application was submitted to claim the “unconditional embodiment”. Medtronic filed a declaratory judgment action to declare the reissue patent invalid for reclaiming matter surrendered during prosecution of the original patent. Both the trial court and the CAFC decided that the reissue patent was valid because the Applicant did not reduce the scope of the claims intentionally or by argument over any prior art. It is clear in this case that the reissue claims with only one electrode is more broad than the claims of the patent that required two electrodes.

It is the position of Appellant that the above two binding precedents are “on all fours” with the present application because the claims of this reissue application only claim what the inventor had a right to claim in the original prosecution but by inadvertence and mistake did not do so. In the Preliminary Amendment, filed May 29, 1998, in this reissue application Appellant’s attorney noted with regard to the fact situation of this case in view of Doyle that “As

in Doyle, the reissue section of the patent code was enacted precisely to correct the kind of error that occurred in the prosecution of the application resulting in the patent.” (Emphasis added)

In Medtronic, it is stated “This is the kind of inadvertence or mistake that the reissue doctrine was meant to remedy” (Emphasis added) 465 F.3d 1360, 1375. These two controlling precedents are compelling with respect to the reversal of the rejection based upon “recapture”, which Applicant respectfully requests.

B. Rejection of claims 131-152 under 35 U.S.C. 103(A) over Mackinnon et al in view of Smith.

Rejection of claims 131-152 under 35 U.S.C. 103(A) as being unpatentable over the ‘067 patent” (Mackinnon Et Al) in view of the ‘587 patent (Smith). It is typical in the art of developing a fire resistant phosphate ester hydraulic fluid that a jet aircraft manufacturer designs an aircraft to meet higher standards of performance than possessed by the last improved jet aircraft. After having done so, the jet aircraft manufacturer then presents the new operating conditions to manufacturers of fire resistant hydraulic fluids. The operating conditions provide new requirements for an acceptable fire resistant hydraulic fluid to be used in such new high performance aircraft. This was the genesis of the present invention wherein it was discovered that phosphate ester hydraulic fluids of the prior design did not meet the new requirements set by the aircraft manufacturer. Thus, a new phosphate ester hydraulic fluid meeting the new requirements needed. In this instance the phosphate ester was required to have a different chemical structure than was used in the last improved jet aircraft. In addition to the change in chemistry of the fire resistant hydraulic fluid, it was also necessary to develop an improved,

novel additive package. It is well known in the art to which the presently claimed invention relates that the additive package is designed to match the unique phosphate ester newly required.

The forgoing explanation is intended to present the conditions under which the worker in the field of fire resistant jet aircraft hydraulic fluid must work. Such conditions create a matrix type of research that includes many factors in the development of a successful product as is noted in the present application. The choices to be made with regard to each required ingredient in the new fluid are seemingly endless.

Given the fact situation involved with this invention, the inventor provided a novel, patentable new combination of phosphate esters wherein the alkyl moieties had the iso-alkyl structure, rather than the n-alkyl structure of the prior art, in combination with a novel additive package. Such combination met the new, more stringent requirements of the aircraft manufacturer, in particular, the fluid life of the inventive fluid. What is not apparent from the present application was the surprise and astonishment of the inventor when the data from comparative testing showed that the novel additive package, when added to the prior art n-alkyl phosphate ester fluid, showed that there was no statistical difference in fluid life of the prior art n-alkyl type fluid than was obtained with the novel, patentable phosphate ester fluid containing the iso-alkyl moieties under the more stringent conditions that was the genesis of the new iso-alkyl type phosphate ester fluid.

The Examiner has rejected the appealed claims on the basis of the decision by the Supreme Court in KSR International Co. vs. Teleflex, Inc. et al, 127 S. Ct.1727 (2007), (hereinafter referred to as the "KSR decision"). A unanimous court reversed the decision of the

lower court and found the patented invention obvious as a matter of law in the light of the prior art out of “common sense”. The lower court (C.A.F.C.) held that material genuine issues of fact precluded summary judgment on the issue of obviousness. Such decision by the C.A.F.C was based on a method of analysis of the prior art termed the TSM, (i.e., “teaching, suggestion and motivation” method of prior art analysis). Such analysis was rejected in this case by the Supreme Court which concluded that the invention was obvious as a matter of law on basis of “common sense”.

The invention in the KSR decision was a mechanical device. Such inventions are clearly seen by the court as an obvious aggregation of parts that function independently without cooperation between the joined devices to produce a new result. In summarizing their approach to the issue of obviousness the Court stated:

“A court must ask whether the improvement is more than the predictable use of prior-art elements according to their established functions.” [127 S. Ct. 1731]

In the KSR decision the Court found only predictable results. However, in view of the background in which the inventor in the present invention was working, there was no predictability with respect to what would be acceptable in the a hydraulic fluid for the newer, more advance jet aircraft. More advanced jet aircraft employ different materials than previously used and different operating conditions which, in many respects, were more severe that was encountered in the prior art. The effect of such differences are particularly demonstrated by the fact the phosphate ester fluids first found acceptable in the prior art (denominated in the

specification as “LD4 fluids”) are chemically different than those found acceptable in the advanced jet aircraft and claimed. Unlike the facts involved in the KSR decision there are unexpected results demonstrated by test results in this application. Accordingly, the KSR decision is distinguished on the facts and, when properly read, supports patentability of the present claims. When employed as directed by the specification supporting the claims on appeal, one finds not only improvements through the use of the presently claimed additive package in the advanced isoalkyl-type phosphate ester fluid, but also in the n-alkyl prior art phosphate ester based hydraulic fluids much to the surprise of the “more than ordinarily skilled worker” in the art to which this invention relates, (i.e., the inventor).

Thus, the combination of ingredients of the claimed additive package used in accordance with the directions in the specification has provided surprisingly improved results as has been shown by evidence in the record of this application. This evidence of unexpected results is set forth in the Declaration of Dr. Terry Wolfe¹ and is contained in the data filed in the continuation-in-part application in the record of this application. These results demonstrate the improved stability of the hydraulic fluid, whether of the preferred isoalkyl C4 or C5 substituents of the phosphate esters or of the prior art alkyl phosphate esters. These results are of the type termed “unexpected” and “surprising”, lending patentability to the claimed novel additive package. These are the facts lacking in the KSR decision wherein the Court sought recourse to the “common sense” approach to the issue of obviousness. The evidence on unexpected results bars

¹ A copy of which is set forth in the Evidence Appendix and was made of record in the reexamination of U.S. Patent 5,464,551, which subsequently was reissued as Reissue Patent 37,101 the parent patent of the present reissue application now being appealed.
STLD01-1419831-3

recourse to the “common sense” approach to the issue of obviousness by the Court in the KSR decision.

Among the many precedents with respect to a finding of patentability under the facts of this application, the most pertinent and most often cited decision of the Court of Appeals for the Federal Circuit in this situation is In re Papesch, 137 USPQ 43 (Fed. Cir. 1963) (hereinafter “Papesch”). While that decision concerned chemical compounds which were rejected as being obvious, the Court’s reasoning is applicable here with respect to chemical compositions. The below quoted portion of the opinion by Judge Rich in Papesch summarizes the reasoning that provided the basis for finding an otherwise “obvious” invention to be “non-obvious”.

“From the standpoint of patent law, a compound and all of its properties are inseparable; they are one and the same thing; graphic formula, chemical nomenclature, systems of classification and study such as concepts of homology, isomerism, etc., are mere symbols by which compounds can be identified, classified, and compared; but a formula is not a compound and, while it may serve in a claim to identify what is being patented, the thing that is being patented is not a formula but a compound identified by it. Patentability of the thing does not depend on similarity of the former compound to the latter; there is no basis in law for ignoring any property in making such a comparison; an assumed similarity based on comparison of formulae must give way to evidence that the assumption is erroneous.” (Emphasis added.) [137 USPQ 51]

In the present application there is ample evidence of surprising, unexpected results obtained by the use of the claimed additive package in phosphate ester hydraulic fluids i.e., its properties. There is nothing in the prior art that would suggest the improvements discovered by Applicant in the claimed compositions. The Papesch precedent has been followed in analogous circumstances in areas of chemical invention other than compounds. See for example In re Otto Von Schichk, 150 USPQ 300 (Fed.Cir. 1966) (hereinafter “Schichk”). The invention involved in

that decision was a chemical process that provided an increase in yield. A rejection for obviousness was overcome on the basis of the unexpected result. The opinion stated in part:

“We find no suggestion of this characteristic [increased yield] of the claimed process. It appears to be quite unexpected and, being part of the invention as a whole, it should be treated under the law as is an unexpected property in compositions.” [150 USPQ 302]

The Schichk opinion then cites the Papesch decision as precedent for the conclusion of non-obviousness with respect to the claimed process. Most recently, in August, 2007, the CAFC again followed this precedent and cited Papesch in its decision In re Sullivan, 84 U.S.P.Q.2nd 1034, 1040 (Fed. Cir. 2007) (hereinafter “Sullivan”), involving an invention claiming an antivenom composition. Accordingly, the remarkable and unexpected improvements obtained by use of the claimed composition herein is part of the composition just as was the unexpected property of the compound in Papesch, the process in Schichk and the composition in Sullivan.

Although the KSR decision introduced the concept of “common sense” into the determination of whether an invention is or is not “obvious”, the courts have not abandoned the criteria of In re Papesch. An example is provided in the decision Sullivan decision which was rendered months after the KSR decision had been handed down. With all of the references before the inventor, there is nothing that guided the path to the present invention except arduous work and testing to discover the combination of additives that would not only improve the novel fluids having specific iso- C₄ and C₅ alkyl groups but also the fluids of the prior art. Thus, under the law as announced in Papesch, the prior art cited by the Examiner does not support a valid rejection under 35 U.S.C. 103(a) in the present application in view of the present record.

While the '067 patent and the '587 patent might appear to be within the ambit of "common sense", it must be noted that the Smith patent had been available for 20 years prior to the earliest effective filing date of the present application (1992). However, no one of ordinary skill in the art has deemed it "obvious" to improve the prior art fluids, as has been surprisingly discovered by the present inventor. This vacancy in the prior art gives weight to the common sense conclusion of non-obviousness. While the genesis of the present additive package was the effort to find a hydraulic fluid for an advanced aircraft, it was surprising and unexpected that the additive package also improved the fluids of the prior art. The number of years that the '587 patent was available belies the "common sense" approach to the obviousness rejection made herein. Accordingly, the rejection of the claims on the basis of the '067 patent in view of the much older '587 patent is respectfully requested to be reversed.

C. Rejection Of Claims 131-152 Under 35 U.S.C. 103(A) Over Mackinnon et al In View Of Smith And Further In View Of Great Britain Patent 1,370,728 And French Patent 2,120,127.

The rejection of claims 131-152 under 35 U.S.C. 103(A) as being unpatentable over the '067 Patent (Mackinnon et al) in view of the '587 Patent (Smith) and further in view of the Britain Patent and the French Patent. The above remarks with respect to the 067 patent and the '587 patent (particularly directed to Papesch and Schichk) are repeated here. These precedents are similarly applicable to the British and French patents.

This rejection is a typical example of an attempt to reconstruct the claimed invention by patching together various aspects from different references in the prior art. It is an example of

not considering the invention “as a whole”, as required by the controlling statute. The question may be asked whether one of ordinary skill in the art would combine these references, as the Examiner has done, even though all relate to phosphate ester compositions. In particular, the British patent discloses an antioxidant that comprises a “synergistic combination” of a hindered phenol in combination with a hydrogen phosphate ester. Choosing only the hindered phenol out of the British patent is apparent only with the information contained in Appellant’s application. As noted above, one of ordinary skill in the art would have to pick and chose some ingredients while leaving out others. Thus, there would be no more obviousness in choosing hindered phenol than eliminating the hydrogen phosphate. One of ordinary skill is provided no basis to select one and not the other. As noted above, in hindsight the process of reconstructing the invention from the prior art can be performed by picking and choosing selectively. However, prior to the invention this was not possible since there is no suggestion in the prior art to guide the inventor in the selection process, other than test results generated by the inventor. The suggestion that the British patent renders the hindered phenol obvious ignores the fact that such hindered phenol of the prior art is combined with another agent which was taught to produce a “synergistic” effect. There is no basis for one of ordinary skill in the art to have chosen one of a pair of compounds that are synergistically operative together. The novel combination of the claimed additive package is Applicant’s invention, not that each component was unknown for use in phosphate ester hydraulic fluids.

The French patent is cited to provide a disclosure of a hindered phenol antioxidant in a tri-phenyl phosphate ester fluid quite unlike the phosphate ester fluid which formed the genesis of the present additive package. Again, this art is from a publication providing greatly different

base stock fluids that were employed during the investigation of an additive for a very different base stock. However, the picking and choosing of the parts which now can readily be done with reference to the appellant's claims was not available to Appellant when the invention was made. That is, there are more aspects of the prior art not chosen than chosen and there is no guidance in the art as to which parts of the prior art to combine, as are now combined in the present claims. Both the British and French patents do not add materially to the rejection on the basis of the '067 patent and the '587 patent for the reason that the environment in which the present appellant was working was so far removed from the state of the art in the early 1970's that no reliance upon such art could be made in view of the advances in aircraft capability, materials employed and operating conditions which provided the background upon which Appellant was working to provide the presently claimed invention. To the surprise of all concerned the claimed additive package has been shown to improve prior art phosphate ester hydraulic fluids, actually an unintended and surprising result of the research conducted by Appellant.

To show the surprising results of the presently claimed additive package for prior art phosphate ester hydraulic fluids (termed "Type IV" fluids) sold by the present assignee of the parent patent US 5,464,551 under the trademark "Skydrol", reference is made to the examples in the present application to demonstrate the thermal stability of fluid compositions at temperatures exceeding 300°F. Also shown in the present application are data comparing a competitive fluid sold by Chevron International Oil Company under the trademark "Hyjet IVA". Example 12 (Table 11) and Example 13 (Tables 11 and 12) compares several Type I V and more advanced phosphate ester hydraulic fluids containing iso-alkyl groups (termed "Type V" fluids) based on their thermal stability at 325°.

In Example 13, Table 12, sample 5 is a Type V fluid with triisobutylphosphate/diisobutylphenyl phosphate ("TIBP/DIBPP") base stock and the claimed novel additive package. Sample 2 is a prior art fluid with tributylphosphate and dibutylphenylphosphate base stock but containing the presently claimed additive package as was included in sample 5. A comparison of the hydrolytic stability of sample 2 with the hydrolytic stability of Skydrol shows the marked improvement of the prior art fluid when combined with the presently claimed additive package.

Further evidence of the surprising and unexpected results of the present invention is contained in the Wolfe Declaration. This declaration is of record in the file history of this reissue application and has been referred to repeatedly to support the facts relating to the surprising result of improved prior art phosphate ester hydraulic fluids. In the Wolfe Declaration, Type IV (prior art) and Type V fluids (novel advanced fluid containing the presently claimed novel additive package) were tested and compared. The Type IV fluid was provided with the novel additive package of the present claims. The most relevant differences in the base stock fluids are in the nature of the alkyl groups and the additive package. In the Type IV fluid the alkyl groups are termed "normal" or "n-Type", while the advanced novel fluid contained alkyl groups termed "iso-Type". The compositions were subjected to thermal stability tests analogous to those demonstrated in the present reissue application to analyze the "fluid life" of the compositions.

As stated at page 5 of the Wolfe Declaration, "The fluids were tested to determine if any significant improvement is seen in the fluid life of a functional fluid composition based on the improved base stock (substantially iso- vs. n-alkyl phosphate esters) and /or the improved additive package of the claimed invention." The results of the tests are presented in Table 2 of

the Wolfe Declaration followed by averages of the values shown in Table 2 at the top of p. 6 of the Declaration. The n-Type IV and iso-Type IV fluids are those with the prior art additive package while the n-Type V and iso-Type V fluids are those with the presently claimed novel additive package. The data at the top of p. 6 of the Declaration is summarized in paragraph 8 of the Declaration. What is shown by this data is that the novel additive package of the present invention improved the prior art “n-Type IV” fluid to the extent of statistically matching the improved novel “iso-Type V” fluid. This data conclusively shows that the presently claimed novel additive package surprisingly improved the prior art n-Type fluid.

The data in the Wolfe Declaration shows that had those of ordinary skill in the prior art known of the novel additive package now claimed, the prior art fluids containing the n-Type alkyl groups could have been improved without going to the trouble of designing a chemically new fluid containing only C4 and C5 iso-alkyl groups. According to the rejection applied to the present claims under 35 U.S.C. 103(a) such an “obvious” combination was available to those of ordinary skill in this art for many years. However, such an additive package was not disclosed or taught in the prior art and certainly one of ordinary skill could not have predicted that the n-alkyl Type fluid could have been improved to the degree now discovered by the Appellant. The evidence of nonobviousness noted above has been in the file of this application but not recognized by the Examiner as having the value clearly seen and demonstrated in the Wolfe Declaration.

The Examiner dismissed the evidence of the surprising and unexpected improved results as shown above as being not commensurate with the scope of the invention. However, such conjecture must be supported by evidence or reasoning substantiating doubts so expressed. In re

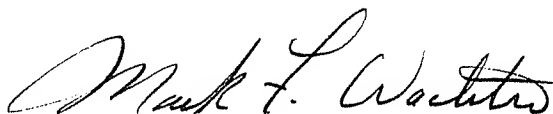
Dinh-Hguyen and Stenhagen, 181 U.S.P.Q. 46 (C.C.P.A. 1974). Also, it has long been held in cases involving chemical inventions that one member of a class in an example is sufficient to support the whole class where no instance is cited to show inoperativeness with a particular member of the class Ex parte Duffley, 113 U.S.P.Q. 352 (P.O.B.A. 1957). Where there is clear evidence of a broader disclosure 35 U.S.C. 112 does not require specific examples of everything within the scope of the invention. In re Anderson, 176 U.S.P.Q. 331 (C.C.P.A. 1973). Accordingly the evidence presented in the application and the Wolfe Declaration demonstrates the unexpected, surprising improvement of prior art (n-alkyl) phosphate ester base stocks. Such data showing surprising results fulfills the exception to the “common sense” rule of the KSR decision. Therefore, rejection of claims 131-152 on the basis of obviousness under 35 U.S.C. 103(a) is not warranted in view of the above-noted four references and reversal thereof is respectfully requested.

VIII. Conclusion

For the foregoing reasons, Appellant respectfully submits that claims 131-152 should be deemed allowable. Appellant therefore respectfully requests reversal of the rejections under 35 U.S.C. 152 and 35 U.S.C. 103(a). The U.S. Patent and Trademark Office is hereby authorized to deduct any additional fees that may be required in this appeal from Deposit Account No. 11-0160.

Respectfully submitted,

Date: June 23, 2008



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IX. Claims Appendix

1.-130. (Cancelled)

131. (Previously Presented) A novel combination of additives useful for mixing with phosphate ester based aircraft hydraulic fluids comprising:

- (a) an acid scavenger comprising an epoxide compound;
- (b) an anti-erosion additive comprising an alkali metal salt of a perfluoroalkyl sulfonic acid;
- (c) a viscosity index improver comprising a methacrylate ester polymer at least 95% by weight of the polymer having a molecular weight of between about 50,000 and 1,500,000; and
- (d) an antioxidant wherein said antioxidant is selected from the group consisting of a hindered phenol and said hindered phenol in combination with an amine compound.

132. (Previously Presented) An additive composition as set forth in claim 131 comprising a 2,4,6-trialkylphenol, a di(alkylphenyl)amine and a hindered polyphenol selected from the group consisting of bis(3,5-dialkyl-4-hydroxyaryl)methane and 1,3,5-trialkyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxyaryl)benzene and mixtures thereof.

133. (Previously Presented) An additive composition as set forth in claim 131 comprising:

- (a) a viscosity index improver comprising a methacrylate ester polymer, the repeating

units of which substantially comprise butyl and hexyl methacrylate, at least 95%
by
weight of the polymer having a molecular weight of between about 50,000 and
about

1,500,000;

(b) an anti-erosion agent comprising an alkali metal salt of a perfluoroalkyl
sulfonic acid, the alkyl substituent of which is selected from the group consisting
of hexyl, heptyl, octyl, nonyl, decyl, and mixtures thereof;

(c) an acid scavenger comprising an epoxide compound;

(d) 2,4,6-trialkylphenol

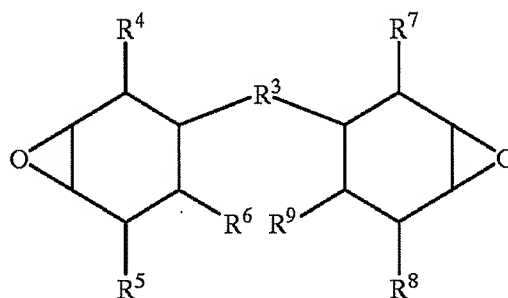
(e) a di(alkylphenyl)amine; and

(f) a hindered polyphenol selected from the group consisting of bis(3,5-
dialkyl-4-hydroxyaryl)methane, 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl)-4-
hydroxyaryl)benzene and mixtures.

134. (Previously Presented) A novel combination of additives suitable for use in
phosphate ester based aircraft hydraulic fluids comprising:

(a) a viscosity index improver a viscosity index improver comprising a
methacrylate ester polymer, the repeating units of which substantially comprise
butyl and hexyl methacrylate, at least 95% by weight of the polymer having a
molecular weight of between about 50,000 and about 1,500,000;

- (b) an anti-erosion comprising an alkali metal salt of a perfluoroalkylsulfonic acid, the alkyl substituent of which is selected from the group consisting of hexyl, heptyl, octyl, nonyl, decyl, and mixtures thereof;
- (c) an acid scavenger and selected from the group consisting of a derivative of a 3,4-epoxy cyclohexane carboxylate and a diepoxide compound corresponding to the formula:



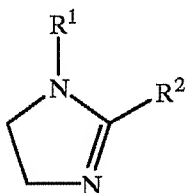
wherein R³ is an organic group containing 1 to 10 carbon atoms, from 0 to 6 oxygen atoms and from 0 to 6 nitrogen atoms, and R⁴ through R⁹ are independently selected from among hydrogen and aliphatic groups containing 1 to 5 carbon atoms, and mixtures of the 3,4-epoxycyclohexane carboxylate and the diepoxide compound;

- (d) 2,4,6-trialkylphenol,
- (e) a di(alkylphenyl)amine; and
- (f) a hindered polyphenol selected from the group consisting of bis(3,5-dialkyl-4-hydroxyaryl)methane, 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxyaryl)benzene, and mixtures thereof.

135. (Previously Presented) An additive composition as set forth in claim 134 further comprising benzotriazole or a benzotriazole derivative as a copper corrosion inhibitor.

136. (Previously Presented) A composition as set forth in claim 134 further comprising an alkali metal arenate.

137. (Previously Presented) A composition of claim 131 further comprising a 4,5-dihydroimidazole compound, the 4,5-dihydroimidazole compound corresponding to the formula



wherein R¹ is selected from the group consisting of hydrogen, alkyl, alkenyl, hydroxyalkyl, hydroxyalkenyl, alkoxyalkyl and alkoxyalkenyl, and R² is selected from the group consisting of alkyl, alkenyl and aliphatic carboxylate.

138. (Previously Presented) An additive composition as set forth in claim 137 wherein R¹ is hydrogen or lower alkyl and R² is a fatty acid residue.

139. (Previously Presented) An additive composition as set forth in claim 137 wherein R¹ is hydroxyalkyl and R² is alkenyl.

140. (Previously Presented) An additive composition as set forth in claim 137 wherein the 4,5-dihydroimidazole is selected from the group consisting of 2-(8-heptadecenyl)-4,5-dihydro-1H-imidazole-1-ethanol and the condensation product of a C₁₄ to C₁₈ fatty acid and 4,5-dihydro-1H-imidazole.

141. (Previously Presented) An additive composition as set forth in claim 140 wherein the 4,5-dihydroimidazole compound is the condensation product of a C₁₆ to C₁₈ fatty acid and 4,5-dihydro-1H-imidazole.

142. (Previously Presented) An additive composition as set forth in claim 137 wherein the hindered phenol antioxidant comprises a mixture of a hindered phenol and a hindered polyphenol.

143. (Previously Presented) Additive composition as set forth in claim 142 wherein the hindered polyphenol comprises a compound selected from the group consisting of bis(3,5-dialkyl-4-hydroxyaryl)methane, 1,3,5-trialkyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxyaryl)benzene, and mixtures thereof.

144. (Previously Presented) An additive composition as set forth in claim 137 wherein the antioxidant amine compound is a diarylamine.

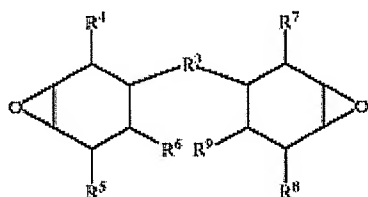
145. (Previously Presented) A composition as set forth in claim 144 wherein said diarylamine comprises di(p-octylphenyl)amine.

146. (Previously Presented) A composition as set forth in claim 144 further comprising 2,6-di-tertiary-butyl p-cresol.

147. (Previously Presented) A composition as set forth in claim 131 wherein the hindered phenol antioxidant comprises a mixture of a hindered phenol and a hindered polyphenol.

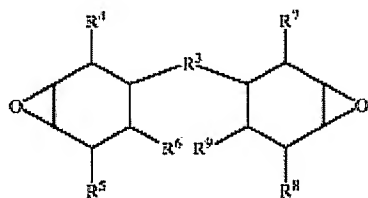
148. (Previously Presented) A composition as set forth in claim 147 wherein the amine antioxidant is a diarylamine.

149. (Previously Presented) A composition as set forth in claim 131 wherein said epoxide acid scavenger is selected from the group consisting of a derivative of a 3,4-epoxy cyclohexane carboxylate and a diepoxide compound corresponding to the formula



wherein R^3 is an organic group containing 1 to 10 carbon atoms, from 0 to 6 oxygen atoms and from 0 to 6 nitrogen atoms, and R^4 through R^9 are independently selected from among hydrogen and aliphatic groups containing 1 to 5 carbon atoms, and mixtures of the 3,4-epoxycyclohexane carboxylate and the diepoxide compound.

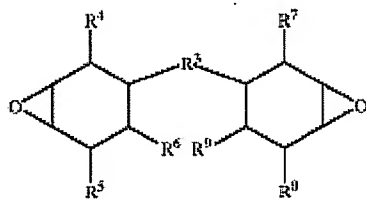
150. (Previously Presented) A fluid composition as set forth in claim 133 wherein said epoxide acid scavenger is selected from the group consisting of a derivative of a 3,4-epoxy cyclohexane carboxylate and a diepoxide compound corresponding to the formula



wherein R^3 is an organic group containing 1 to 10 carbon atoms, from 0 to 6 oxygen atoms and from 0 to 6 nitrogen atoms, and R^4 through R^9 are independently selected from

among hydrogen and aliphatic groups containing 1 to 5 carbon atoms, and mixtures of the 3,4-epoxycyclohexane carboxylate and the diepoxide compound.

151. (Previously Presented) A composition as set forth in claim 137 wherein said epoxide acid scavenger is selected from the group consisting of a derivative of a 3,4-epoxy cyclohexane carboxylate and a diepoxide compound corresponding to the formula



wherein R³ is an organic group containing 1 to 10 carbon atoms, from 0 to 6 oxygen atoms and from 0 to 6 nitrogen atoms, and R⁴ through R⁹ are independently selected from among hydrogen and aliphatic groups containing 1 to 5 carbon atoms, and mixtures of the 3,4-epoxycyclohexane carboxylate and the diepoxide compound.

152. (Currently Amended) A composition as set forth in [of] claims 131 or 137 [115], wherein in the anti-erosion additive comprising an alkali metal salt of a perfluoroalkyl sulfonic acid the alkyl substituent comprises from 5 to 12 carbon atoms.

Application of Gerbrand Deetman
Application No. 09/801,883
Appeal Brief

X. Evidence Appendix

1. Declaration of Dr. Terry C. Wolfe Pursuant to 37 C.F.R. §132.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reexamination of:)
U.S. Patent No. 5,464,551 :
Issued: November 7, 1995 :
Inventor: GERBRAND DEETMAN :
Assignee: Monsanto Company :
Application No.: 99,267 :
Filed: July 28, 1993 :
For: STABILIZED PHOSPHATE :
ESTER-BASED FUNCTIONAL :
FLUID COMPOSITIONS :

Assistant Commissioner for Patents
Washington, D.C. 20231
Box: Reexamination

Sir:

Declaration Of Dr. Terry C. Wolfe
Under 37 C.F.R. §1.132

I, Terry C. Wolfe, hereby declare as follows:

1. I am presently an employee of the Monsanto Company, the assignee of the U.S. Patent No. 5,464,551 ("the '551 patent"). I received a B.S. in Chemistry from Texas Christian University in 1973 and a Ph.D. in Chemistry from Florida State University in 1977. I have been employed with Monsanto since 1977, in the fields of analytical chemistry from 1977 to 1993 and functional fluids, including hydraulic fluids, from 1993 to the present. My experience with hydraulic fluids includes several years of research and development of phosphate ester-based functional fluid

compositions including leading the development of Monsanto's Skydrol® 5 line of fire-resistant hydraulic fluids.

2. I am familiar with the '551 patent and understand that Monsanto is submitting this Declaration as part of a Request for Reexamination of the patent. Based on my knowledge of the art in this field, my reading of the '551 patent, and tests that were conducted to compare the fluid life of the claimed fluid compositions, it is my opinion that the claimed fluids have unexpected advantages over prior art functional fluid compositions. As is discussed more fully below, the claimed invention comprises a unique combination of base stock and additives that is not taught or suggested in the prior art. This combination provides a functional fluid composition having unexpectedly improved thermal stability characteristics.

3. The functional fluid composition disclosed and claimed in the '551 patent is a substantial improvement over the phosphate ester-based functional fluid compositions known in the art. The claimed fluid compositions demonstrate improved thermal stability over compositions of the prior art, in particular at temperatures exceeding 300°F. This Declaration provides the results of tests conducted to compare the properties of prior art "Type IV" fluids with Monsanto's new "Type V" fluids at 275°F and compares these

results to the data disclosed in the Examples of the '551 patent.

4. The term "Type IV fluids" as used in this Declaration refer to fluids known in the art as having erosion-arresting and fire-resistant characteristics.^{1/} The term "Type V fluids" refers to the fluids that also have erosion-arresting and fire-resistant characteristics yet have lower density and improved thermal stability characteristics. The fluids claimed in the '551 patent are referred to herein as Type V fluids. The lower density of Type V fluids is due to the increased amount of alkyl-substituted phosphate ester base stocks as compared to phenyl-substituted phosphate esters. The improved thermal stability is explained more fully below. Although the designation of "Type V" has not been adopted by the entire aviation industry, one major aircraft manufacturer, McDonnell-Douglas, has adopted new specifications for aviation hydraulic fluid compositions that were based on the performance characteristics of Monsanto's Type V fluids.

5. Tests were conducted on Type IV and Type V formulations as follows:

Table 1

^{1/}Okazaki et al., attached hereto as Exhibit 1 and discussed more fully below, provides a brief history of phosphate ester-based functional fluids. In particular, note Figure 2 on page 19.4-5.

<u>Compound</u>	<u>Type IV (%)</u>	<u>Type V (%)</u>
Trialkyl phos.	59.9	89.0
Dialkylaryl phos.	32.8	-
Triaryl phos: (S-154)	-	3.0
Acid Scavenger (MCS-1562)	5.8	5.8
Copper Inhibitor (FH-132)	.5	.5
Iron Inhibitor (VANLUBE RIG)	-	.025
Phenolic Antioxidant #1 (IONOL)	1.0	.25
Phenolic Antioxidant #2 (E702)	-	.45
Phenolic Antioxidant #3 (E330)	-	.45
Amine Antioxidant (DODPA)	-	.45
Anti-erosion Additive (FC-98)	.025	.025

The base stocks were comprised of trialkyl and dialkylaryl phosphate esters (Type IV) or trialkyl and triaryl phosphate esters (Type V). The trialkyl phosphate esters used were C₄ (tri-n-butyl or tri-iso-butyl) and C₅ (tri-n-amyl or tri-iso-amyl). The dialkylaryl phosphate esters used were mixtures comprising approximately 70% dialkylaryl phosphates, 12% trialkyl phosphates and 18% alkyl diaryl phosphates. The aryl portion of the compounds was phenyl and the alkyl portion was either C₄ (n-butyl or iso-butyl) or C₅ (n-amyl or iso-amyl). The remaining ingredients represent the "additive package" of the fluid composition. The designations for the ingredients referred to in parentheses are defined in Example 12 of the '551 patent at Columns 32-34. Thus, the test fluids represent n-Type IV, n-Type V, iso-Type IV, and iso-Type V compositions.

6. The compositions were subjected to thermal stability tests analogous to those demonstrated in the Examples of the '551 patent to analyze the "fluid life" of the composition. The various blends were placed in stainless steel tubes with metal coupons (steel, cadmium steel, copper, aluminum,

magnesium) and heated in an oven to 275°F. The tubes were removed from the oven and purged with air every 100 hours. Each composition was monitored for depletion in the amount of acid scavenger remaining in the tubes. The acid scavenger will react with any acids formed as a result of the hydrolysis of the phosphate esters in the base stock. The "fluid life" is defined as the time required to deplete 90% of the acid scavenger. The fluids were tested to determine if any significant improvement is seen in the fluid life of a functional fluid composition based on the improved base stock (substantially iso- vs. n-alkyl phosphate esters) and/or the improved additive package of the claimed invention. Fluid life is considered by those of ordinary skill in the art of functional fluid compositions to be an important property of a fluid composition. Results are presented in Table 2.

Table 2

<u>Compound</u>	<u>Fluid Life (hours)</u>
Type IV n-butyl	2012
Type V n-butyl	2366
Type IV iso-butyl	2131
Type V iso-butyl	2267
Type IV n-amyl	2211
Type V n-amyl	2265
Type IV iso-amyl	2128
Type V iso-amyl	2217
Type IV n-butyl	2091
Type V n-butyl	2356
Type IV iso-butyl	2287
Type V iso-butyl	2502

The averages of the values the data in Table 2 are as follows:

n-Type IV 2105 hours
iso-Type IV 2182 hours

n-Type V 2329 hours
iso-Type V 2328 hours

8. The data in Table 2 shows that at 275°F, n-Type IV fluids have a significantly shorter fluid life than n-Type V fluids and iso-Type IV fluids have a significantly shorter fluid life than iso-Type V. However, at 275°F, there is no statistically significant difference in fluid life between n-Type IV and iso-Type IV or between n-Type V and iso-Type V.

9. The Examples in the '551 patent demonstrate the thermal stability of the claimed fluid compositions at temperatures exceeding 300°F. Example 12 (Table 11) and Example 13 (Tables 11 and 12) compares several "Type IV" and "Type V" hydraulic fluids based on their thermal stability at 325°F. Example 5 (with Figures 6 to 9) and Example 7 (with Figure 12) demonstrate the improved thermal and oxidative stability of functional fluids due to the presence of the additive package of the claimed invention.

10. In Example 12, sample 3 is a type V fluid with a triisobutylphosphate/diisobutylphenyl phosphate ("TIBP/DIBPP") base stock. Sample 1 is a type V fluid with a tributylphosphate/dibutylphenylphosphate ("TBP/DBPP") base stock and essentially the same additive package as sample 3. Sample 2 is a type V fluid with a TBP/DBPP base stock and the same additive package as sample 3. Sample LD-4 is a type IV

prior art fluid with a TBP/DBPP basestock, which has a higher density than Sample 2 due to a greater amount of DBPP in the basestock and different additive package.

11. Comparing the results for sample 3 (1264 hr.) to the results for sample 1 (677 hr.) and sample 2 (420 hr.) demonstrates that Type V fluids that contain tri-isobutylphosphate basestocks have a significantly improved thermal stability at 325°F. Comparing the results for sample 3 to the results for sample LD-4 (300 hr.) demonstrates that both tri-isobutylphosphate basestock and the additive package of the invention have a cumulative effect in improving the thermal stability of Type V fluids at 325°F.

12. In Example 13, sample 11 is a Type V fluid with a tri-isobutylphosphate/triphenylphosphate ("TIBP/TPP") basestock and sample 5 is a type V fluid with a tri-isobutylphosphate/di-isobutylphosphate ("TIBP/DIBPP") basestock. Sample 2 and LD-4 are the same Type V and Type IV fluids, respectively, as discussed above for Example 12. Samples 11, 5 and 2 have the same additive package which is the additive package of the claimed invention and LD-4 has a prior art additive package.

13. Comparing the results for sample 11 (greater than 1000 hours) and sample 5 (1000 hours) to the results for sample 2 (450 hours) also demonstrates that Type V fluids having the

tri-isobutylphosphate basestock of the claimed invention have a significantly improved thermal stability at 325°F over fluids that do not contain this basestock. Further, the cumulative effect of the tri-isobutylphosphate basestock and the additive package of the invention can be seen in a comparison of the results for samples 11 and 5 with the results for sample LD-4 (300 hours)

14. Example 5 shows the thermal stability of Type V fluids at 300°F with 0.1% to 0.5% moisture and at 375°F with no moisture. Figure 8, when compared with Figures 6 and 7, shows that a Type V fluid (LD-5) with the additive package of the claimed invention has a significantly improved thermal stability at 300°F over Type IV fluids (LD-4 and H4A) which have a prior art additive package. Figure 9 shows the significant beneficial effect of the additive package of the claimed invention in Type V fluids at 375°F when compared to Type IV fluids with the prior art additive package.

15. Example 7 shows the oxidation stability at 350°F of fluids with and without the additive package of the claimed invention. Figure 12 shows that Type V fluids containing the additive package of the claimed invention are significantly more stable than two Type IV prior art fluids with similar basestocks but containing a prior art additive package.

16. The following references, attached to and made part of this Declaration as Exhibits 1-4, demonstrate the significance of the results of the thermal stability tests conducted at temperatures below 300°F and above 300°F:

a) Okazaki, M.E. et al., "Hydrolysis of Phosphate-Based Aviation Hydraulic Fluids" in *TECHNISCHE AKADEMIE ESSLINGEN* 8th International "Tribology 2000" Colloquium Jan. 14-16, 1992 Proceedings, pages 19.4-1 to 19.4-10 (Exh. 1);

b) Wilson, D.R., "Exploratory Development on Advanced Fluids and Lubricants in Extreme Environment by Mechanical Characterization" in *Technical Report AFML-TR-70-32, Part III*, (Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio; January 1972) (Exh. 2);

c) Brooks, S. and Schwenker, H., "Chemical Physical and Mechanical Properties of Low Density Phosphate Ester Hydraulic Fluids" in *Technical Report AFML-TR-73-78*, (Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio; April 1973) (Exh. 3); and

d) Kirk-Othmer Encyclopedia of Chemical Technology (3d ed.) Vol. 12, pages 712-733 (Exh. 4).

17. Okazaki et al. discuss the effect of temperature on hydrolysis of phosphate ester based fluids and demonstrate that hydrolysis occurs much faster at 300°F than at 260°F (see, Figure 9). The Air Force Technical Reports show the results of 50 hour hydraulic pump circuit thermal stability tests on phosphate ester based fluids at 275°F, 300°F, and

350°F. The results show that there were no signs of fluid degradation at 275°F. However, changes occurred during the tests at higher temperatures whereby incipient fluid degradation occurred at 300°F and gross fluid degradation occurred early on at 350°F. (See, Exh. 2 at pages 32-35 and Exh. 3 at pages 6, 27 and 109). The Kirk-Othmer Encyclopedia passage discussing hydraulic fluids provides a figure on page 716 that shows the normal acceptable range for continuous service of phosphate esters and presents an upper limit of 300°F.

18. These references highlight 300°F as a point where a comparison can be made of the properties of phosphate ester based hydraulic fluids. For the acid scavenger depletion tests discussed here, the rate of depletion of acid scavenger at temperatures below 300°F would be expected to be lower because the acid scavenger would mainly be reacting with hydrolysis products. At temperatures above 300°F, the rate of acid scavenger depletion would be expected to be much higher due to reaction of the acid scavenger with hydrolysis products and other degradation products.

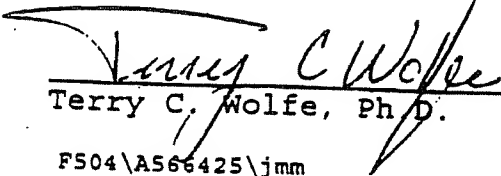
19. Thus, because of the expected lower rate of depletion of the acid scavenger at 275°F, one would not expect to see a significant difference in the fluid life among the tri-alkylphosphate ester-based fluid compositions having various base stocks. As shown above in paragraphs 5-8, when a prior

art additive package is used in all test compositions, no significant difference in fluid life occurs when the phosphate ester base stocks were varied from isoalkyl to normal alkyl. However, when all the test compositions contain the same trialkyl phosphate ester, a significant increase in the fluid life is demonstrated at 275°F when the claimed additive package is used as compared to when a prior art additive package is used. Based on the teaching of the art discussed above, this result is unexpected.

20. On the other hand, when conducting experiments under the conditions of the Examples in the '551 patent, i.e., temperatures exceeding 300°F, one would expect to see a significant decrease in the fluid life due to the reaction of acid scavenger with hydrolysis products and other degradation products. As discussed above, the Examples in the '551 patent demonstrate that both the iso-alkyl phosphate ester base stock and the additive package contribute to provide the functional fluids of the claimed invention, which possess unexpectedly improved thermal stability over compositions of the prior art when tested at temperatures above 300°F.

All statements made herein of my own knowledge are true and all statements made herein on information and belief are believed to be true. This Declaration is made with the understanding that any willful false statements and the like so made are punishable by fine or imprisonment, or both (18

USC 1001) and may jeopardize the validity of the application or any patent issuing thereon.


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24 JUNE 97

Date

X. Related Proceedings Appendix

None.